CLAIMS

We claim:

1. A method of improving a signal in an image sequence acquired with a digital color video camera creating a digital video signal including a brightness signal component and a color signal component, said method comprising the steps of:

continuously evaluating the brightness signal component to calculate maximum brightness values and minimum brightness values at least within a first predetermined image sector and at least for a partial sequence of images;

continuously calculating offset values on the basis of at least two previously calculated minimum brightness values;

continuously calculating gain values based on differences between at least to previously calculated maximum brightness values and the associated minimum brightness values;

continuously modifying the brightness signal component by subtracting the last calculated offset value therefrom and by then multiplying it with the last gain value; and

continuously modifying the color signal component by multiplying it with the last calculated gain value and a predetermined weighting factor at least for a second predetermined image sector.

2. The method of claim 1, further comprising the step of smoothing the brightness signal component before its evaluation by calculating an average value of a predetermined number of neighboring picture elements.

3. The method of claim 1, wherein in the step of continuously evaluating the brightness signal component the maximum brightness value and the minimum brightness value are

evaluated within the first image sector.

4. The method of claim 2, wherein in the step of continuously evaluating the brightness signal component the maximum brightness value and the minimum brightness value are evaluated within the first image sector.

5. The method of claim 1, wherein each image of the image sequence includes two frames, and wherein in the step of continuously evaluating the brightness signal component the maximum brightness value and the minimum brightness value are evaluated approximately within one entire frame.

6. The method of claim 2, wherein each image of the image sequence includes two frames, and wherein in the step of continuously evaluating the brightness signal component the maximum brightness value and the minimum brightness value are evaluated approximately within one entire frame.

7. The method of claim 1, wherein the first predetermined image sector and the second predetermined image are identical.

8. The method of claim 1, wherein each image of the image sequence includes two frames, and wherein in the step of continuously evaluating the brightness signal component the maximum brightness value and the minimum brightness value are calculated for every other frame.

9. The method of claim 1, wherein in the step of continuously calculating offset values the offset values are calculated on the basis of differences between the calculated minimum

brightness values and a predetermined brightness value corresponding to zero brightness.

10. The method of claim 1, wherein the brightness values which are the basis for the continuous calculation of the offset values are weighted differently.

11. The method of claim 1, wherein the brightness values which are the basis for the continuous calculation of the gain values are weighted differently.

12. The method of claim 1, wherein the brightness values which are the basis for the continuous calculation of the offset values and the brightness values which are the basis for the continuous calculation of the gain values are weighted differently.

13. The method of claim 1, wherein the gain values are calculated on the basis of quotients of a predetermined difference value corresponding to a maximum brightness resolution and differences between the previously calculated maximum brightness values and the associated minimum brightness values.

14. The method of claim 1, wherein at least the step of continuously evaluating the brightness signal component, the step of continuously modifying the brightness signal component and the step of continuously modifying the color signal component are realized by hardware.

15. The method of claim 1, wherein an analog video signal is created from the modified digital video signal to display the image sequences on a color monitor.

16. The method of claim 1, wherein the image sequences acquired with a digital color

video camera are such ones of a medical operation in a body cavity, the image sequences being then presented in real-time on a monitor to an operating surgeon.

17. A method of improving a signal in an image sequence acquired with a digital color video camera creating a digital video signal including a brightness signal component and a color signal component, said method comprising the steps of:

smoothing the brightness signal component by calculating an average value of a predetermined number of neighboring picture elements;

continuously evaluating the brightness signal component to calculate maximum brightness values and minimum brightness values within a predetermined image sector and at least for a partial sequence of images;

continuously calculating offset values on the basis of at least two previously calculated minimum brightness values;

continuously calculating gain values based on differences between at least to previously calculated maximum brightness values and the associated minimum brightness values;

continuously modifying the brightness signal component by subtracting the last calculated offset value therefrom and by then multiplying it with the last gain value; and

continuously modifying the color signal component by multiplying it with the last calculated gain value and a predetermined weighting factor at least for the predetermined image sector.

18. The method of claim 17, wherein each image of the image sequence includes two frames, and wherein in the step of continuously evaluating the brightness signal component the maximum brightness value and the minimum brightness value are calculated for every other frame.

19. The method of claim 17, wherein in the step of continuously calculating offset values the offset values are calculated on the basis of differences between the calculated minimum brightness values and a predetermined brightness value corresponding to zero brightness.

20. Software for performing a method of improving a signal in an image sequence acquired with a digital color video camera creating a digital video signal including a brightness signal component and a color signal component, the method comprising the steps of:

continuously evaluating the brightness signal component to calculate maximum brightness values and minimum brightness values at least within a first predetermined image sector and at least for a partial sequence of images;

continuously calculating offset values on the basis of at least two previously calculated minimum brightness values;

continuously calculating gain values based on differences between at least to previously calculated maximum brightness values and the associated minimum brightness values;

continuously modifying the brightness signal component by subtracting the last calculated offset value therefrom and by then multiplying it with the last gain value; and continuously modifying the color signal component by multiplying it with the last calculated gain value and a predetermined weighting factor at least for a second predetermined image sector.

21. The software of claim 20, wherein the method further comprises the step of smoothing the brightness signal component before its evaluation by calculating an average value of a predetermined number of neighboring picture elements.

22. The software of claim 20, wherein in the step of continuously evaluating the brightness signal component the maximum brightness value and the minimum brightness value are

evaluated within the first image sector.

23. The software of claim 21, wherein in the step of continuously evaluating the brightness signal component the maximum brightness value and the minimum brightness value are evaluated within the first image sector.

24. The software of claim 20, wherein each image of the image sequence includes two frames, and wherein in the step of continuously evaluating the brightness signal component the maximum brightness value and the minimum brightness value are evaluated approximately within one entire frame.

25. The software of claim 21, wherein each image of the image sequence includes two frames, and wherein in the step of continuously evaluating the brightness signal component the maximum brightness value and the minimum brightness value are evaluated approximately within one entire frame.